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The terrestrial isopods (Isopoda: Oniscidea) of Greece. 22nd contribution: Genus *Monocyphoniscus* (Trichoniscidae)[1]

Helmut Schmalfuss

Abstract

The terrestrial isopod *Monocyphoniscus bulgaricus* Strouhal, 1939 is redescribed and illustrated. The following taxa are synonymized with *M. bulgaricus*: *Kosswigius* (= *Monocyphoniscus*) *caniensis* Vandel, 1958 from Crete, *Kosswigius delattini* Verhoeff, 1941 and *Kosswigius bilselii* Verhoeff, 1941, both from northwestern Turkey. New records from northeastern Greece and the Peloponnese are presented, all records of the species are summarized and mapped. The systematic situation of the genus *Monocyphoniscus* is discussed.
Keywords: Isopoda, Oniscidea, *Monocyphoniscus*, Greece, new synonyms.

Zusammenfassung

Die Landisopoden-Art *Monocyphoniscus bulgaricus* Strouhal, 1939 wird nachbeschrieben und illustriert. Die folgenden Taxa werden mit *M. bulgaricus* synonymisiert: *Kosswigius* (= *Monocyphoniscus*) *caniensis* Vandel, 1958 von Kreta, *Kosswigius delattini* Verhoeff, 1941 and *Kosswigius bilselii* Verhoeff, 1941, beide aus der nordwestlichen Türkei. Neufunde aus dem nordöstlichen Griechenland und von der Peloponnes werden mitgeteilt, alle Nachweise der Art werden zusammengefasst und kartiert. Die systematische Situation der Gattung *Monocyphoniscus* wird diskutiert.

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[1] 21st contribution see Stuttgarter Beiträge zur Naturkunde, Serie A (Biologie) 681 (2005).

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1 The genus *Monocyphoniscus* Strouhal, 1939

Diagnosis given by STROUHAL (1939): Dorsal part of cephalothorax with numerous small tubercles; one ommatidium present; pereion-tergites with 6+6 longitudinal ridges consisting of rows of tubercles; third pleon-tergite with one big median tubercle; pleon-tergites IV and V and telson with two bigger tubercles; tergites without honeycomb-like microstructure.

STROUHAL contrasts this diagnosis with the one of *Tricyphoniscus* Verhoeff, 1936, described also from Bulgaria; *Tricyphoniscus* differs from *Monocyphoniscus* by lacking ommatidia, the pereion-tergites bearing only 4+4 longitudinal ribs, the pleon-tergites IV and V having one single median tubercle and the tergites being equipped with a honeycomb-like microstructure.

Formally this diagnosis separates *Monocyphoniscus* from all other genera of the Haplophthalminae. It seems, however, doubtful whether diagnostic differences between the genera of this group should be based on details of the tuberculation only. Male characters of pleopods are very similar and uniform inside the whole group, and the differences of tuberculation appear in a number of cases rather to reflect specific than generic differences. In my view the species ascribed to *Monocyphoniscus* would perfectly fit into the genus *Cyphoniscellus* Verhoeff, 1901, if the diagnosis of this genus would be slightly enlarged. A careful re-evaluation of the genera of the Haplophthalminae, including the sophisticated use of molecular data, would be advisable. This is, however, outside the scope of the present article, so in the present state of knowledge I leave the genus *Monocyphoniscus* untouched.

I establish a number of new specific synonymies (see next chapter), and I suspect that also the two species *M. babadagensis* (Radu, 1965) (= *Cyphoniscellus b.*) from Romania and northeastern Bulgaria and *M. loritzi* Karaman & Karaman, 1966 from Macedonia (southern former Yugoslavia) are synonyms of *M. bulgaricus* (compare RADU 1965, KARAMAN & KARAMAN 1966). The differences towards *M. bulgaricus*, indicated in the descriptions of these two species, can either be due to individual variability, or, concerning the male characters, have to do with the age and size of the specimens (see description below). However, since no type material of *M. babadagensis* and *M. loritzi* was available for examination I leave these questions open.

The genus *Kosswigius* Verhoeff, 1941 is an unavailable name since no type species has been designated. *Kosswigius caniensis* Vandel, 1958 has been transferred to *Monocyphoniscus* by VANDEL (1968). The species *Kosswigius delattini* Verhoeff, 1941 and *Kosswigius bilselii* Verhoeff, 1941 are considered synonyms of *Monocyphoniscus bulgaricus*, so the genus name *Kosswigius* can no longer be applied for a valid species.

Abbreviations

SMNS Staatliches Museum für Naturkunde Stuttgart, Germany
ZSM Zoologische Staatssammlung Munich, Germany

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photographs. Dr. S. TAITI (Florence/Italy) reviewed an earlier draft of the present paper and made valuable suggestions to improve the manuscript. To all of them I wish to express my sincere thanks.

2 *Monocyphoniscus bulgaricus* Strouhal, 1939

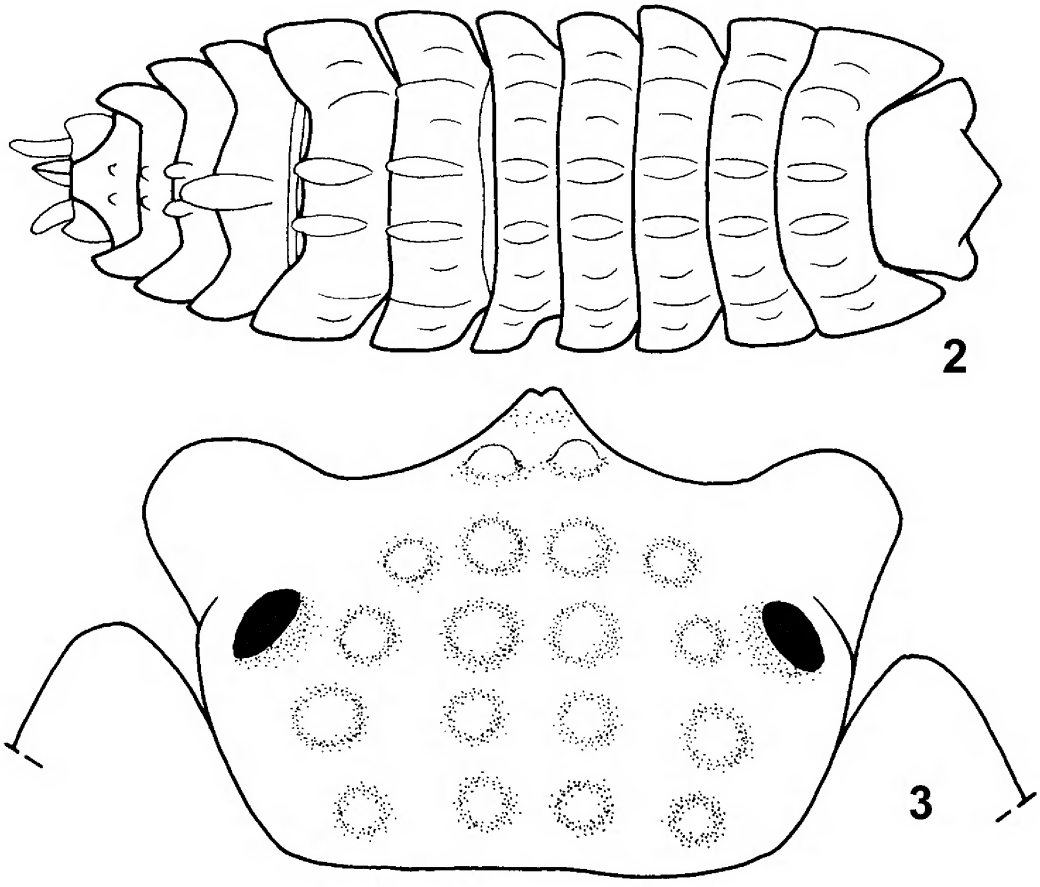
Monocyphoniscus bulgaricus: STROUHAL 1939: 196, figs. 3–8; STROUHAL 1940: 18; VANDEL 1965: 264; KARAMAN & KARAMAN 1966: 32, 33; ANDREEV 1972: 181; ANDREEV 2002: 67.
Kosswigius caniensis (**n. syn.**): VANDEL 1958: 85, figs. 2A–B, 3A–B.
Monocyphoniscus caniensis: VANDEL 1968: 622; SFENTHOURAKIS 1993: 617; SCHMALFUSS et al. 2004: 14.
Kosswigius delattini (**n. syn.**): VERHOEFF 1941: 228, figs. 1–4 (p. 257); VANDEL 1980: 86; SCHMALFUSS 1999: 6.
Kosswigius bilselii (**n. syn.**): VERHOEFF 1941: 229.

Material examined

Bulgaria: 2 ex., southern Bulgaria, district Kardžali, Gorna Snejunka, cave Hasarska Peštera, leg. BERON, 16.XII.1962 (SMNS 5462, published in ANDREEV 1972).

Greece: 2 ex., northeastern Macedonia, Falakró Mountain, Vólakas, 1100 m, leg. PIEPER, 21.IX.1995 (SMNS 2530). – 1 ex., northeastern Macedonia, Pangéo Mountain, monastery Ikosifinísi, 500 m, leg. PIEPER, 20.IV.1987 (SMNS 2165). – 1 ex., northeastern Macedonia, 10 km N of Paleá Kavála, 600 m, leaf litter of *Castanea*, leg. SCHMALFUSS, 20.IV.1994 (SMNS 2366). – 2 ex., northeastern Macedonia, delta of Néstos River, riverine forest, leg. SCHAWALLER, 26.IV.1994 (SMNS 2367). – 17 ex., eastern Thrace, Sápka Pass 19 km E of Néa Sánda, 900 m, leaf litter of *Fagus*, leg. SCHMALFUSS, 24.IV.1994 (SMNS 2368). – 3 ex., northeastern Aegean, island Lésvos, western part, 6 km SE of Eresós, bank of brook, leaf litter of *Platanus*, leg. ERHARD, 8.V.1995 (SMNS 2490, published in SCHMALFUSS 1999 as *Kosswigius delattini*). – 5 ex., northeastern Aegean, island Lésvos, northern part, Lepétimnos Mountain, 900 m, spring, leaf litter of *Platanus*, leg. ERHARD, 14.V.1995 (SMNS 2500, published in SCHMALFUSS 1999 as *Kosswigius delattini*). – 5 ex., southern Peloponnese, northern Taígetos Mountain, Neokhóri, bank of brook, *Platanus* and *Abies*, 1100 m, leg. SCHAWALLER & SCHMALFUSS, 30.IX.2004 (SMNS 2832). – 11 ex., western Crete, Élos, spring, leaf litter of *Platanus* and *Castanea*, leg. SCHMALFUSS & SFENTHOURAKIS, 24.IV.2002 (SMNS 2740, published in SCHMALFUSS et al. 2004 as *M. caniensis*).

Fig. 1. *Monocyphoniscus bulgaricus*, ♂, 4.2 mm long, NE-Greece (SMNS 2368), micro-photograph, dorsal view. – Scale: 0.5 mm.



Figs. 2–3. *Monocyphoniscus bulgaricus*. – **2**. Same specimen as in Fig. 1. **3**. ♀, 4.0 mm long, same locality, drawing based on a SEM-photograph.

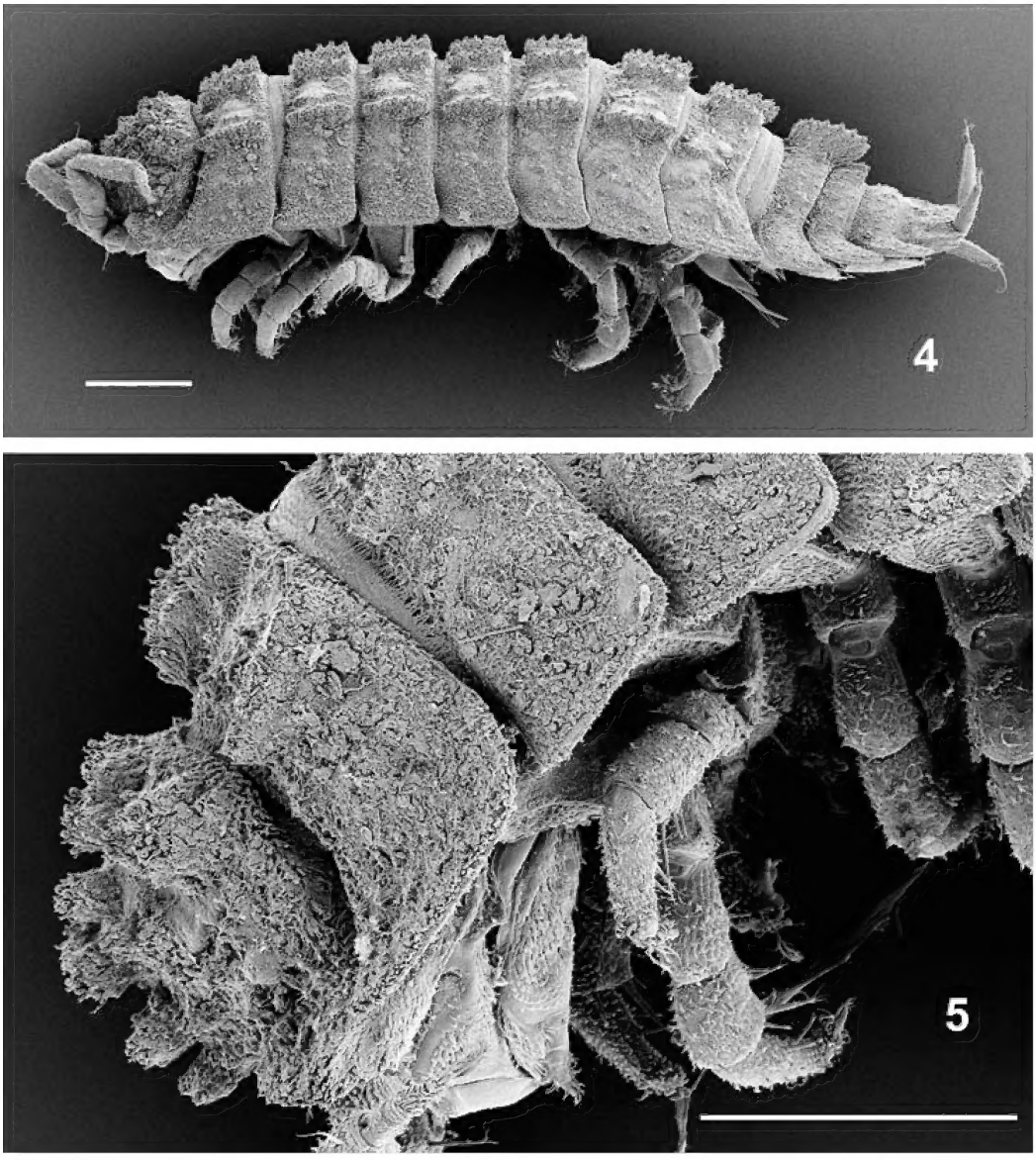
NW-Turkey: 3 ex., syntypes of *Kosswigius bilselii* Verhoeff, 1941, European part of Turkey, 30 km W of Istanbul, cave Yarim Burgas, leg. Kosswig & de Lattin, date? (ZSM, Verhoeff 1941). – 6 ex., syntypes of *Kosswigius delattini* Verhoeff, 1941, "Inkayaköyü, Dorf südl. von Brussa [= Bursa]", leg. Kosswig, IX.1940 (ZSM, Verhoeff 1941).

Description

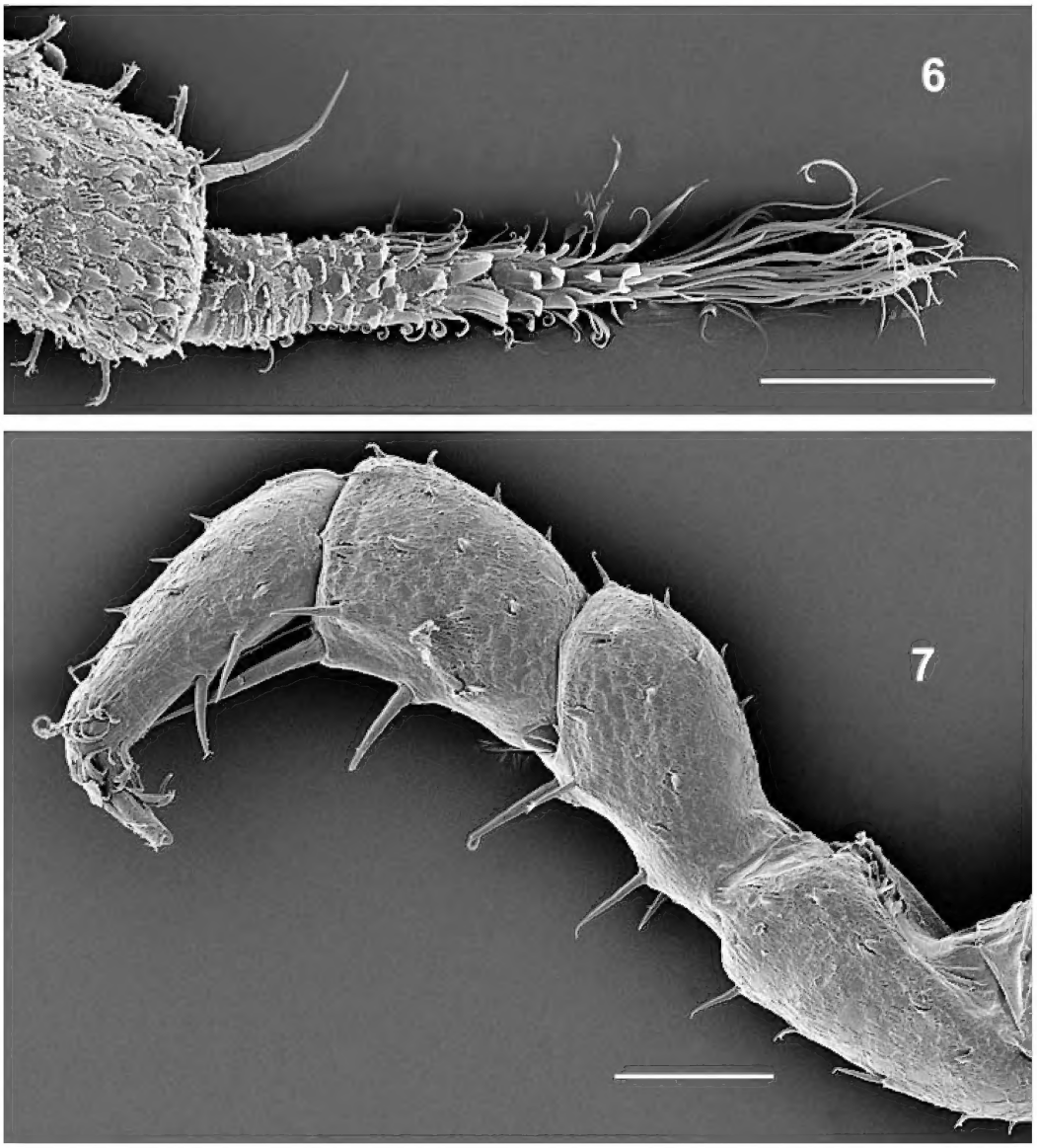
Maximum dimensions: 4.2 × 1.6 mm.

Coloration: Without pigmentation, ommatidium with dark pigment.

Cuticular structures: Head dorsally with 5–6 pairs of paramedian tubercles more or less regularly placed in two rows, the frontal pair fused to a single two-pointed frontal median process, and with lateral groups of 5–6 tubercles (Fig. 3); smaller tubercles scattered inbetween these main groups. Pereion-tergites with 4 pronounced major ridges whose crests are serrated, tergites I–VI with additional 4 minor ridges laterally of the major ones (Figs. 1–2, 4–5). Pleon-tergite III with huge single tubercle which extends posteriorly beyond the hind margin of the tergite, pleon-tergite IV with two small tubercles, tergite V and telson with pairs of faint tubercles (Figs. 1–2, 4). Without honeycomb structure on tergites, hairy scales give a furry appearance to the surface, which is covered with many humus particles.



Figs. 4–5. *Monocyphoniscus bulgaricus*, SEM-photographs of air-dried specimens, lateral views. – **4**. Specimen from Crete (SMNS 2740). **5**. Specimen from NE-Greece (SMNS 2368). – Scales: 0.4 mm.



Figs. 6–7. *Monocyphoniscus bulgaricus*, SEM-photographs of air-dried specimen, ♂, 4.0 mm long, NE-Greece (SMNS 2368). – **6**. Antennal flagellum. **7**. Pereiopod I. – Scales: 0.1 mm.

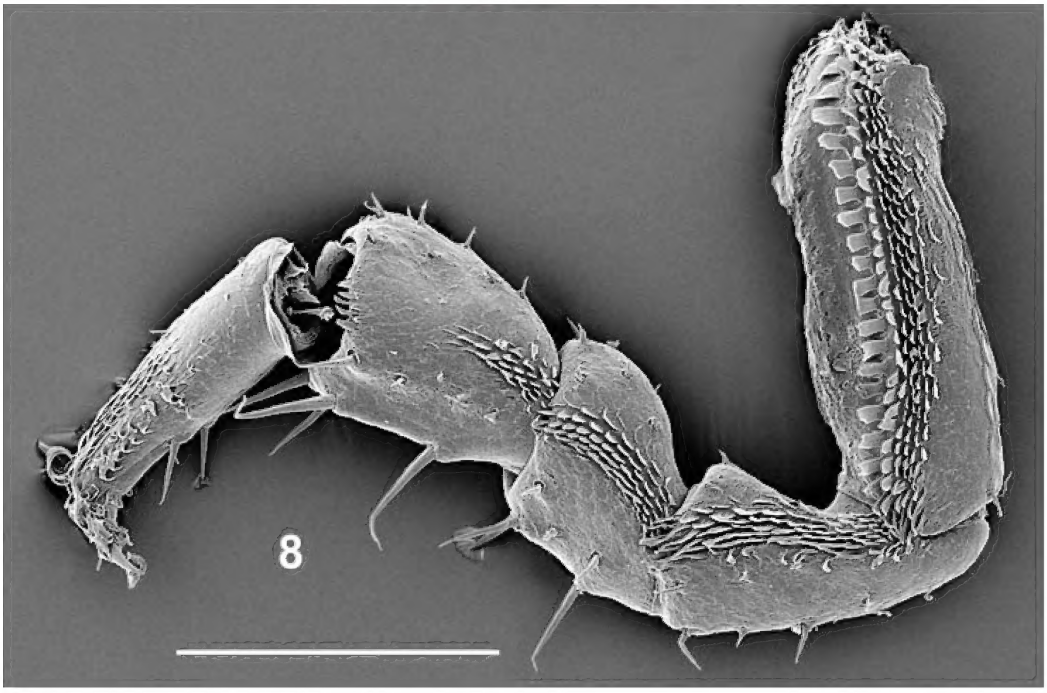
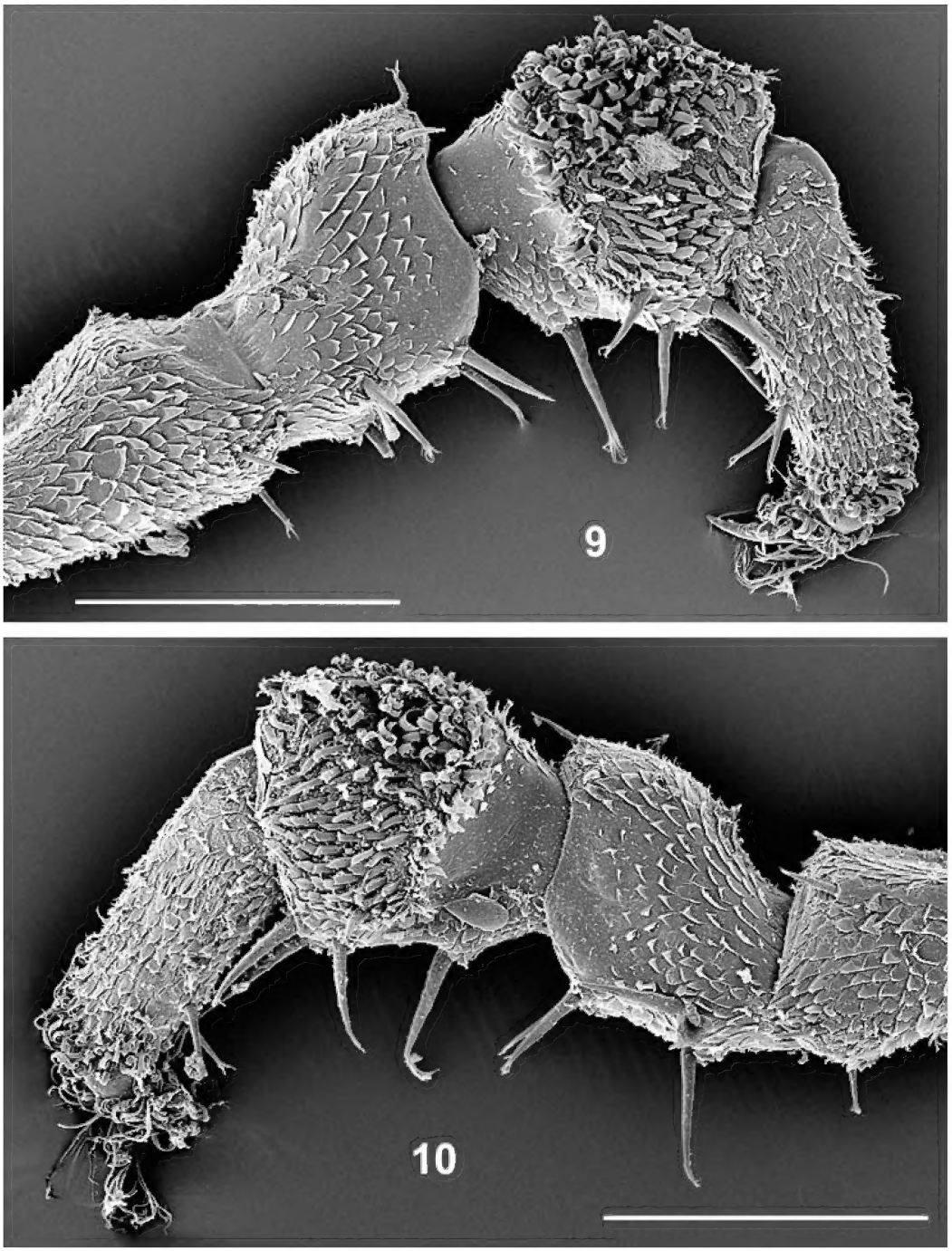


Fig. 8. *Monocyphoniscus bulgaricus*, SEM-photograph of air-dried specimen, juvenile ♂, 2.8 mm long, NE-Greece (SMNS 2368), pereiopod VII, frontal side. – Scale: 0.2 mm.

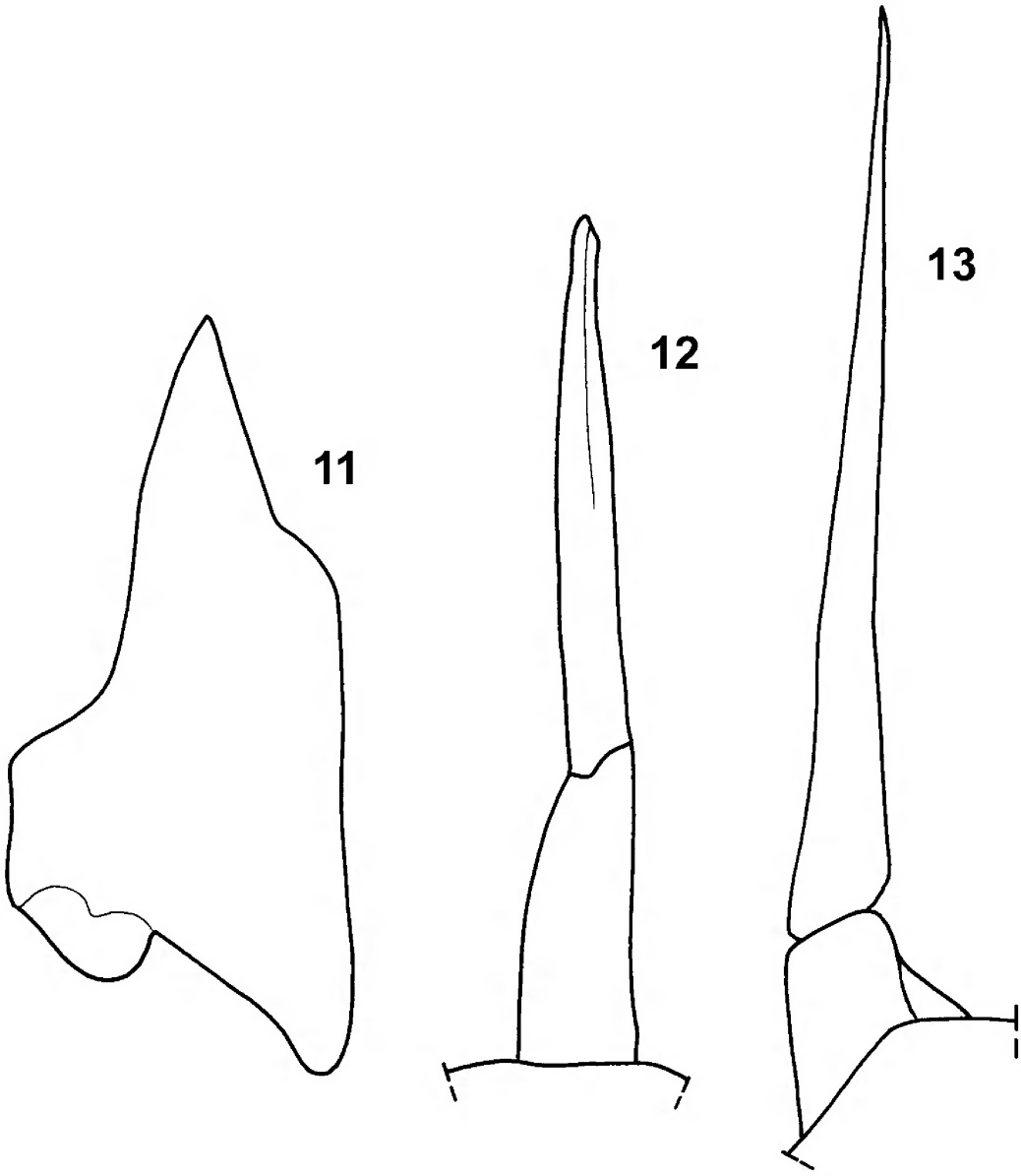
Head with semicircular or trapezoidal side-lobes (also in the specimens from Bulgaria) (Fig. 3), not triangular as in the illustration of STROUHAL (1939: 196, fig. 3), which seems to be a steeply angled view; one pigmented ommatidium; median lobe with two-pointed process, surpassing side-lobes. Pereion-epimera and pronounced pleon-epimera III–V see Figs. 1–2. Telson with truncated apex as in most Haplophthalminae (Figs. 1–2). Antennal flagellum with long terminal brush of sensory hairs (Fig. 6). Male pereiopod I see Fig. 7; pereiopod VII frontally with scale bands of water conducting system (Fig. 8); male carpus VII enlarged in adult specimens, caudally with a field of elongated scales which may function as an anti-slide pad during copulation (Figs. 9–10); in juvenile specimens the carpus VII is not enlarged (Fig. 8). Male pleopod-exopodite I of usual axe-shape (Fig. 11), endopodites I and II see Figs. 12–13.

Recorded distribution (see map Fig. 14)

Southeastern Bulgaria (STROUHAL 1939; VANDEL 1965; ANDREEV 1972, 2002); northeastern Greek mainland (material examined); northeastern Aegean, island Lésvos (SCHMALFUSS 1999 as *Kosswigius delattini*, material examined); southern Peloponnese (material examined); central Aegean, island Ándros (SFENTHOURAKIS 1994 as *M. caniensis*); island Antikíthira NW of Crete (SFENTHOURAKIS 1993 as *M. caniensis*); Crete (VANDEL 1958 as *Kosswigius caniensis*, VANDEL 1968 as *M. caniensis*, SCHMALFUSS et al. 2004 as *M. caniensis*); northwestern Turkey (VERHOEFF 1941 as *Kosswigius delattini* and *K. bilselii*, VANDEL 1980 as *Kosswigius delattini*). If the suspected synonymy of *Monocyphoniscus loritzi* and *M. babadagensis* with *M. bulgaricus* is correct the species occurs also in southern former Yugoslavia and all along the Bulgarian and Romanian coast of the Black Sea.



Figs. 9–10. *Monocyphoniscus bulgaricus*, SEM-photographs, critical point preparation, adult ♂, 4.2 mm long, NE-Greece (SMNS 2368), left (**9**) and right (**10**) pereiopod VII, caudal sides. – Scales: 0.2 mm.



Figs. 11–13. *Monocyphoniscus bulgaricus*, adult ♂, 4.2 mm long, NE-Greece (SMNS 2368). – **11**. Pleopod-exopodite I. **12**. Pleopod-endopodite I. **13**. Pleopod-endopodite II.

3 Remarks

The individual variability, the age-depending differences in the structure of the 7th male pereiopod and the comparatively wide distribution of this species might have been the reason for the fact that it was probably described six times. If *M. babadagensis* and *M. loritzi* are synonyms of *M. bulgaricus* the species is distributed all over southeastern Europe and western Turkey. This distribution area seems to be autochthonous; if it would be due to anthropogenous transportation the species should be expected to be found erratically in other countries as it is the case in

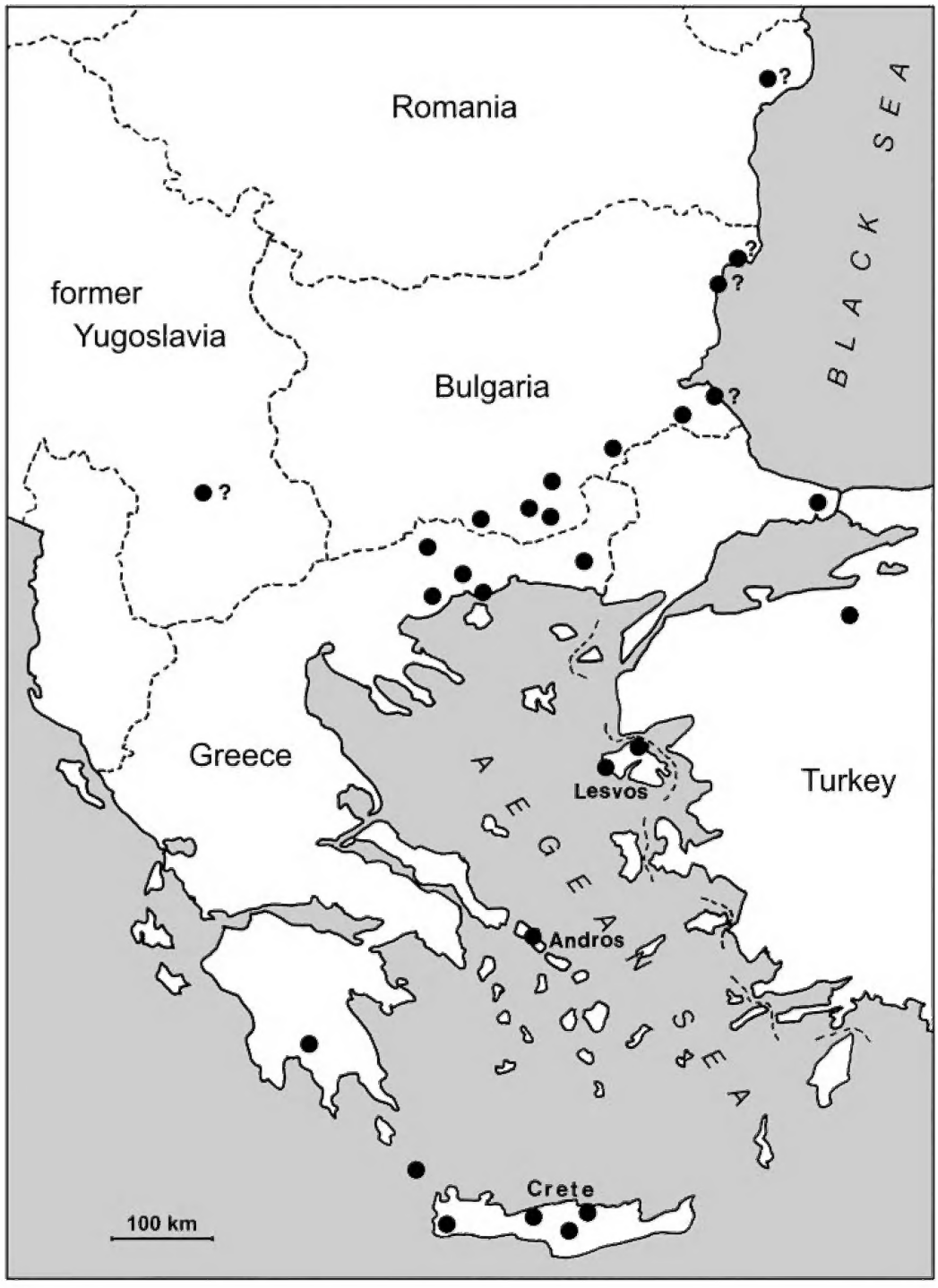


Fig. 14. Records of *Monocyphoniscus bulgaricus* (●); the records with a question mark (●?) refer to *M. loritzi* from Skopje (southern former Yugoslavia) and *M. babadagensis* from the Black Sea coast of Bulgaria and Romania, whose synonymy with *M. bulgaricus* is suspected.

Haplophthalmus danicus. The species is present on quite remote islands of the Aegean (e. g. Antikíthira between Peloponnese and Crete), so it can be concluded that it has populated the region already in the upper Tertiary (Miocene, ± 10 million years ago) when the Aegean was still coherent mainland (compare SFENTHOURAKIS et al. 1999: 391).

Monocyphoniscus bulgaricus has often been found in caves, but it is obviously not an obligatory troglobiont, since it is just as well present in deeper leaf-litter and humus layers outside caves.

Two females of 4 mm length from Crete (Élos, SMNS 2740) have both 9 embryos in their marsupia.

The closest relatives of *Monocyphoniscus bulgaricus* should be found among the species of the genera *Cyphoniscellus*, *Tricyphoniscus* and *Vardaroniscellus* (see discussion on generic diagnosis, for bibliographies see SCHMALFUSS 2003).

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Author's address:

Dr. HELMUT SCHMALFUSS, Staatliches Museum für Naturkunde, Rosenstein 1, 70191 Stuttgart, Germany; e-mail: schmalfuss.smns@naturkundemuseum-bw.de

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